REMARKS

The application has been carefully reviewed in light of the Office Action dated December 31, 2007. Claims 1 to 5 are in the application, with Claims 4 and 5 having been withdrawn from further consideration pursuant to a restriction requirement. Claims 1 and 4 are the independent claims. Reconsideration and further examination are respectfully requested.

Turning first to a formal matter, Applicant respectfully requests that the next Office communication acknowledge Applicant's claim to foreign priority, and receipt of a certified copy of the priority document. A Submission Of Priority Document was filed on June 1, 2004.

Turning to the merits of the Office Action, the specification was objected to for referring to the element "phosphorus" as "phosphor". Claim 1 was objected to for the same reason. Without conceding the correctness of these objections, the specification, abstract, and claims have been amended to change "phosphor" to "phosphorus". Withdrawal of the objections is therefore respectfully requested.

Claim 1 to 3 were rejected under 35 U.S.C. § 103(a) over Japan 11-243218 (Sano) in view of U.S. Patent No. 6,103,138 (Kondo). The rejection is traversed, as discussed more fully below.

The present invention generally concerns a stacked photovoltaic element including a structure formed by sequentially arranging a metal layer, a lower transparent conductive layer, a first n-layer of non-single-crystal silicon, a first i-layer of microcrystal silicon, a first p-layer of non-single-crystal silicon, a second n-layer of non-single-crystal silicon, a second i-layer of microcrystal silicon and a second p-layer of non-single-crystal

silicon on a support body.

According to one aspect of the invention, the first i-layer and the second i-layer contain phosphorus, and the content ratio R1 of phosphorus to silicon of the first i-layer and the content ratio R2 of phosphorus to silicon of the second i-layer are defined by the formula of $R2 < R1$.

By virtue of this arrangement, it is ordinarily possible to manufacture photovoltaic elements showing a high conversion efficiency, while maintaining a high yield factor.

Referring specifically to claim language, independent Claim 1 is directed to a stacked photovoltaic element including a structure formed by sequentially arranging a metal layer, a lower transparent conductive layer, a first n-layer of non-single-crystal silicon, a first i-layer of microcrystal silicon, a first p-layer of non-single-crystal silicon, a second n-layer of non-single-crystal silicon, a second i-layer of microcrystal silicon and a second p-layer of non-single-crystal silicon on a support body, the first i-layer and the second i-layer containing phosphorus and the content ratio R1 of phosphorus to silicon of the first i-layer and the content ratio R2 of phosphorus to silicon of the second i-layer are defined by the formula of $R2 < R1$.

The applied art does not disclose or suggest the features of the present invention, and in particular does not disclose or suggest a first i-layer and a second i-layer containing phosphorus wherein the content ratio R1 of phosphorus to silicon of the first i-layer and the content ratio R2 of phosphorus to silicon of the second i-layer are defined by the formula of $R2 < R1$.

In this regard, page 4 of the Office Action concedes that Sano does not

disclose first and second i-type layers containing phosphorus such that the content ratio of P:Si of the first i-type layer is greater than that of the second i-type layer. Nevertheless, the Office Action relies on Kondo for this feature.

As understood by Applicant, Kondo is directed to a silicon-system thin film, characterized by containing at least 1 ppm of phosphorus atoms and diffraction intensity at the (220) plane with X ray or electron beams of at least 30% of total diffraction intensity. See Kondo, Abstract.

Page 4 of the Office Action asserts that Kondo (Figures 1 and 4, Column 7, lines 23 to 30 and Column 9, lines 29 to 42) discloses single and tandem photovoltaic cells formed from p-i-n junctions having microcrystalline layers, wherein the phosphorus is unevenly distributed in the film, with the concentration increasing towards the electroconductive substrate.

However, the cited portions of Kondo are directed to the phosphorus distribution in a single microcrystalline layer in a single photovoltaic element, and not the relative concentrations between two different i-layers in the same photovoltaic element.

In particular, Kondo discloses the photovoltaic device contains phosphorus atoms unevenly distributed in the silicon-system thin film, and in particular with a concentration increasing towards the substrate. More specifically, irregular grain boundaries are present near the substrate during the initial stage of the film-making process, and because of the relatively smaller grains for that portion, phosphorus atoms can exhibit their favorable effects more efficiently when present in a higher concentration in that portion. See Kondo, Column 4, lines 9 to 19.

Nevertheless, Kondo is only addressing phosphorus irregularities in the

context of the formation of a single layer. Kondo says nothing about the relative concentrations of phosphorus between two separate layers in the photovoltaic element. Thus, in the context of relative phosphorus concentrations across different layers, Kondo offers nothing to remedy the deficiencies of Sano.

Accordingly, Kondo is not seen to disclose a phosphorus relationship between two different i-layers in the same photovoltaic element, much less a first i-layer and a second i-layer containing phosphorus with the content ratio R1 of phosphorus to silicon of the first i-layer and the content ratio R2 of phosphorus to silicon of the second i-layer defined by the formula of $R2 < R1$.

Therefore, independent Claim 1 is believed to be in condition for allowance, and such action is respectfully requested.

The dependent claims are also submitted to be patentable because they set forth additional aspects of the present invention and are dependent from the independent claims discussed above. Therefore, separate and individual consideration of each dependent claim is respectfully requested.

No fees are believed due; however, should it be determined that additional fees are required, the Director is hereby authorized to charge such fees and any additional fees under 37 C.F.R. §§ 1.16 and 1.17 which may be required during the entire pendency of this application, or to credit any overpayment, to Deposit Account 06-1205.

No other matters being raised, the entire application is believed to be in condition for allowance, and such action is courteously solicited.

Applicant's undersigned attorney may be reached in our Costa Mesa, California office by telephone at (714) 540-8700. All correspondence should be directed to our address given below.

Respectfully submitted,

/Michael J. Guzniczak/
Michael J. Guzniczak
Attorney for Applicant
Registration No. 59,820

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3800
Facsimile: (212) 218-2200

FCHS_WS 2063721v1